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ABSTRACT

To determine what content and design features may be included in the new design of the State Library of Ohio's World Wide Web site, the researcher conducted a content analysis of the World Wide Web sites of the fifty state library agencies, using the COSLA (Chief Officers of State Library Agencies) index as the access point. Specifically, content and design features were searched for to see if the current Web site of the State Library of Ohio resembles the Web sites of the other forty-nine state library agencies. A matrix of 28 criteria was prepared and searched for at each Web site. The results include a frequency table of the most common features found in these Web sites. Also discussed is a problem with the index of Web sites--listings on the COSLA site often led to state servers, outdated, or incomplete information, and many states had more than one site. Several Web site design recommendations for state library agencies are made. Seven tables illustrate criteria selection and explanation; selection of appropriate URL (Uniform Resource Locator); criteria frequency; and frequencies of OPAC links, telnet protocol use, interactive e-mail address, and Adobe Acrobat use. An appendix contains the data collection instrument. (Author/DLS)

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ED 423 900

A CONTENT ANALYSIS OF THE WEB SITES OF THE FIFTY STATE LIBRARY AGENCIES OF THE UNITED STATES OF AMERICA

A Master's Research Paper submitted to the Kent State University School of Library and Information Science in partial fulfillment of the requirements for the degree Master of Library Science

by

Nicole M. Berendsen

May 1998

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U.S. DEPARTMENT OF EDUCATION
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

A CONTENT ANALYSIS OF THE WEB SITES OF THE FIFTY STATE LIBRARY AGENCIES OF THE UNITED STATES

Abstract: The State Library of Ohio, the state library agency for Ohio, is preparing a major revision of its World Wide Web site. To determine what may be included in the new design in terms of content and design features, the researcher conducted a content analysis of the World Wide Web sites of the fifty state library agencies. Specifically, certain content and design features were searched for to see if the current web site of the State Library of Ohio resembles the World Wide Web sites of the other forty-nine state library agencies. The methodology used follows other studies that have looked at web sites with the same genre (e.g. public libraries, elementary schools, university/academic libraries). A matrix of twenty-eight criteria was prepared and searched for at each web site. The results include a frequency table of the most common features found in these web sites. An unexpected problem with the index of web sites is discussed. Several recommendations for state library agencies are made concerning web site design.

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Table of Contents

Approval Page	ii
List of Tables	iv
Introduction	1
Literature Review	2
Research Objectives	6
Limitations, Delimitations, and Significance	7
Methodology	8
Data Collection Instrument	10
Results and Data Analysis	11
Problem URL Discussion	19
Summary and Conclusions	24
Bibliography	35
Appendix A - Data Collection Instrument	36

List of Tables

Table 1. Criteria Selection and Explanation	28
Table 2. Selection of appropriate URL	30
Table 3. Frequency table	32
Table 4. OPACs	33
Table 5. Telnet note	33
Table 6. Interactive email address	34
Table 7. Acrobat plugin note	34

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Introduction

When planning a major revision of its World Wide Web site (minor revisions should occur on a daily or weekly basis), an organization/agency has much to consider: new advances in software that can easily add new features; changes in the code of the World Wide Web - HTML (hypertext markup language); changes in the organization/agency that controls the web site; and, changes in the communities that the organization/agency is a part of (what the site links to). When looking for new ideas for a web site, it is natural and almost expected that the site designers look at the ever-growing community of web sites for ideas (Yale C/AIM web site, 1998). An organization like a state library agency may be a part of larger communities, including various library communities (national, state, public, academic), the individual state government community, and other organizational entities. Looking at the web sites of these communities for content and design features that may reasonably be expected to appear in an organization's web site may help site designers determine what new features will be included or excluded in a new web site design.

The web site of the State Library of Ohio, the state library agency for Ohio, has not had a major revision since its inauguration in 1995. Hypertext links have been updated as necessary, but little actual content and few new design features have been added, and the general appearance of the pages and organization of links remains the same. Consequently, the State Library of Ohio is planning a major revision of its web site. One way to determine what new content and design features will be included in the new design would be to do a content analysis of the web sites of one of the communities to which the State Library of Ohio belongs. COSLA (Chief Officers of State Library Agencies) is an organization whose membership is

comprised of state library agencies. A state library agency is defined by COSLA as "state and territorial agencies designated as the state library administrative agency and responsible for statewide library development" (COSLA web site, 1998). Members of COSLA are the target population, or community of web sites, for the following study[1].

Literature review

This review begins with an examination of literature that deals with the basics of general web site design. Whether starting a new web page or doing a major revision, an excellent place to begin is at the beginning - the principles of web page design (Stover and Zink, 1996 and Yale C/AIM web site, 1998). Following this, two articles that have looked specifically at government web pages are reviewed, as all state library agencies are a part of a larger governmental group - a state government. These articles are useful for determining what government web sites fail to accomplish, and what can be done to correct problems. Finally, two articles are reviewed that conduct content analyses of web sites with the same genre (e.g. elementary school, university library, public library).

The World Wide Web is unique, and unlike any other medium ever seen. The World Wide Web is just like any other medium of communication and must use the same basic protocols used by all other media. Which of these two statements is true? According to the literature, both are considerations when creating and

[1] According to the COSLA web site, Hawaii is not a member of COSLA. However, COSLA still indexes a web site for Hawaii that fits into COSLA's description of a state library agency; therefore, this Hawaii web site will be used in the study.

maintaining web sites. Abby Day, in her article on effective web sites, suggests that the basic elements used in general communication should be applied to the creation and maintenance of web sites. She states that "every effective communication has three distinct parts...an explicit purpose, a coherent structure, a relevant conclusion." She emphasizes that "if we do not follow the few, simple rules about effective communication then we will fail in our message, whether the medium is a book, a Web site, or a television show" (Day, 1997).

Contrast these statements with those of Michael Seadle, editor of *Library HiTech*. While not forgetting these basics of communication, he suggests that what is unique about the web world is its dynamic quality. When judging web sites, as *Library HiTech* has done, the web is distinguished from other media, especially the print world, in that form and design are elevated to the same level of importance as the information presented. "In the print world, prize committees stick to the contents. They do not judge a book by its cover or give half the glory to the publisher for making a brilliant layout. The same is not true on the Web. There author and publisher are often one, and a good design seems integral to the reading experience" (Seadle, 1997).

The Yale C/AIM (Yale Center for Advanced Instructional Media) web site, which deals with web site design, brings these emphases together by underscoring both the importance of the principles of effective communication, and the importance of keeping that effort up-to-date. The Yale C/AIM web site also states that a web site designer should "identify all of the content information and graphic resources you will need to collect or create to achieve the goals you have set for

your Web site." The focus of this researcher's study is just that - to identify possible content and design features to be included in a web site design (Yale C/AIM web site, 1998).

All fifty state library agencies have web sites, and all fifty agencies also belong to a larger governmental entity. Governments are generally accused of being bureaucratic, and the web sites created by government agencies are no different. Not only should the web sites of the fifty state library agencies follow the basic principles of web site design, it is important that they avoid the pitfalls that seem to befall government sites. One author concludes that the worst of government web pages simply fail to keep potential users in mind (Johnson, 1996), while another points out that these sites may simply be acting in concordance with a higher authority (Eschenfelder et al, 1997). Johnson also finds with government web pages that "a rush to establish a Net presence has encouraged agencies to mount pages without having clearly defined their intended audience". She concludes that "pages should be built which reflect the constructs and expectations of the clients, and not the structure of the government agencies producing the information", and also suggests that the purpose and audience may be discovered by involving those closer to the information dissemination functions of the agencies, i.e. "proposes a more rigorous evaluation of web publishing which are led by information services, with a smaller role for IT [information technology] personnel than is currently the case" (Johnson, 1996). This may explain why some government web sites seem so bureaucratic. Eschenfelder et al, concentrate on federal government guidelines for web site policies. No actual study is done, but guidelines are proposed for web sites,

especially in the area of information content and ease-of-use. One state library agency did find that while they had to follow the rules of their higher authority (the state administrative offices), they were actually able to get their web site up more quickly due to a coordinated state effort (Hawkes, 1996).

While Abby Day suggests that web site design follows the same conventions as any type of communication, Stover and Zink, in looking at higher education web pages, suggest that "successful design of web home pages can largely follow the principles (few as they may be) of hypermedia document design". Day suggests that these design principles always existed. Stover and Zink suggest that these design principles are new. However, Stover and Zink do acknowledge that "the home page design process must be careful to ... keep the user's needs in mind". Their questionnaire consisted of ten questions that the authors queried of 40 higher education libraries web pages. Points were then subjectively awarded based on these questions, which included whether the page had a purpose statement and allowed user comments (Stover and Zink, 1996).

Also looking at web sites of a particular genre, Laurel Clyde, as part of a larger study, studied public and school library web sites. In particular, she studied 50 public library web sites from 13 countries to compare them for content, looking for certain pre-determined criteria. She found that "few of the public library home pages or web sites appeared to have clearly defined aims", and that "the audience at which some sites were aimed was very unclear". Actual content was found to vary. In addition, 50 school library web sites were studied. Here, too, Clyde found that "some pages had no apparent aim and no clear audience". She notes that without a clear

purpose, "the sites or pages could appear confusing and even chaotic, the very problems authors like Abby Day suggest be avoided. Clyde concludes that "the most effective of the library web sites or home pages appeared to be those that have a clear sense of purpose and a clear sense of the needs of the users" (Clyde, 1996).

In redesigning a governmental web site then, not only do the principles of web site design need to be kept in mind, but so do the pitfalls that government web pages can fall into. Surveying a genre of similar web pages can also help to determine what may reasonably be expected in an organization's web site.

Research Objectives

Objectives:

- To aid in determining what content and design features the State Library of Ohio may include or exclude in its revised web site
- To identify content and design features of web sites of a particular genre (state library agencies)

It is assumed that the approach taken in this study will be useful in the redesign of the State Library of Ohio web site. It is assumed that the COSLA definition of a state library agency will be sufficient in determining, if necessary, which web site is the state library agency web site, and that state library agencies do not have purposes and missions that vary too widely. It is assumed that the researcher will be able to access these sites; if this is found not to be the case, the

site in question will be discarded from the study. It is assumed that the criteria picked will be sufficient to arrive at the conclusions reached.

Limitations, Delimitations, and Significance

This study is being done to assure that all perspectives are being viewed when redesigning a web site. Only the State Library of Ohio will benefit from the immediate study, but others could use the same or similar methodology to gain more insight when doing a web site revision. It is hoped that the results of this study will encourage people responsible for planning revisions of web sites to investigate the many aspects of web site design.

This study is only measuring one aspect of many considerations when planning a major revision of a web site. Beyond this, only one community or genre of web sites is being studied. The results of this study will not apply to web site genres outside of the genre of state library agency web sites. The methodology could be used for other genres of web sites that the State Library of Ohio, or any organization, belongs to. This study is not rating these web sites by any method, objective or subjective, like the subjective rating scale used in the Stover and Zink study of higher education library web sites.

For criteria in this study that deal with content and links, there is no distinction made between content on the local targeted server/directory and links to information on other servers. A question is considered to be positively answered whether the information is stored on the local targeted server/directory, or whether it links directly to a server that has the needed information. This is because there may be no way to

determine whether a server is "local" or not, or the origin of the web site information. An illustration of this problem is an actual example of a section on the State Library of Ohio's web site that was duplicated in the interest of efficiency to another server. The State Library of Ohio webmaster was actually the webmaster of both sites and duplicated pages from one server to the other organization's server. Someone looking at both servers from the outside would have no way of knowing exactly where the information originated. It looks like original information on both, but in reality it is only maintained by one person. Therefore, in this study, a content or link criteria is positively answered whether the information is stored locally or a link is made to it. Criteria that deal with design features must be located on the local targeted server/directory.

This study does not take into account how many links are required at the web site to positively fulfill a criteria. This would require a different type of matrix and statistical setup, plus an investigation of HCI (human-computer interaction) literature. This paper is also not concerned with measuring original content versus the total site content.

Methodology

To execute a content analysis of the web sites of the fifty state library agencies, all fifty web sites that represent these agencies are examined. The entire population is being sampled because it is not unduly large. Though other communities or genres of web sites (populations) could have been chosen, such as other state agencies or GPO Access gateway sites, this population was chosen

because all the sites fit well into the category and actually belong to an organization (COSLA) to whom this information may be reported.

The evaluation itself occurred during a six day time period in March 1998. The evaluation questionnaire, designed by the researcher, includes twenty-eight nominal criteria to be searched for at each web site. If a criteria was found a mark was made indicating fulfillment. For design features, using this nominal scale did not pose a problem. For content criteria, a nominal scale posed a more difficult problem. Therefore, the content features are sufficiently defined so that the fact that a particular criteria is positively identified is clearly evident (see Table 1). An in-depth analysis of fifty web pages should not take more than five to seven days due to the dynamic nature of the web.

The web browser that comes with Netscape Corporation's Navigator® product (version 3.0) is used for viewing web sites. The index of state library web sites listed on the COSLA web site <http://www.cslnet.ctstateu.edu/cosla/> is used to determine the actual locations of these sites. The Library of Congress' State Libraries Index <http://lcweb.loc.gov/global/library/statelib.html> is used as a backup index of needed web sites. The Library of Congress index lists more than one site for some states. If it was necessary to use the Library of Congress index, the site that best fits COSLA's definition of a state library agency was chosen. A listing of the actual URLs visited is provided in Table 2. If a site was unavailable during the first attempt to access it, it was tried the following day, and again until it was accessed. Any sites that were unavailable after the five to seven days allotted for this study were excluded from the study. This did not happen, however.

These sites were evaluated using a matrix developed by the researcher, but based on previous studies that compared the web sites of the same genre (Clyde, 1996 and Stover and Zink, 1996). The criteria were also developed with input and comments from State Library of Ohio staff involved in web site design (see Table 1).

Based on the criteria, a frequency table was developed that shows how many of the web sites have the design features and content items. The frequency table was developed using the spreadsheet program Microsoft Excel® (version 5.0) and the database program Microsoft Access® (version 2.0). Results indicate how many of the sites measured actually fulfill specific criteria. As this is a content analysis, description follows in the results section detailing anomalies and unusual characteristics of the population. These results may influence whether those features will be included in the new web site design of the State Library of Ohio.

Data collection instrument

There are three sections of the data collection instrument (see Appendix A). The first two sections are a series of questions that were answered in a nominal manner - yes or no. The first section scrutinizes the content and links the web sites contain. The second section inspects design features incorporated into the web site. The third section is for comments on the overall design and organization of the sites, and any noted anomalies. If a web site did not meet any or all criteria, the web site is not meant to be branded as unfavorable. It may not be the mission of many of the state library agencies to provide much of the information looked for within the stated criteria. These criteria are not a basis for judging the quality of the web sites of the

stated population. Rather, the aim is to create a frequency table to see how many of the population members do contain the criteria. Similarly, a table showing individual tabulations is not shown in this paper, but is available from the researcher.

Results and Data Analysis

The following results were reached by accessing URLs from the COSLA index to state library agencies' web sites. If there was a technical problem with the URL in the COSLA index, the Library of Congress' index to state library agencies' web sites was used (See Table 2). Certain results may be unexpected because some of the indexed web sites produced interesting results. See further below for a discussion of problems with the URLs in the COSLA index.

If a criteria was found to be embedded in an online newsletter, especially a non-searchable online newsletter, the criteria was not met, unless the item was fairly obvious. Newsletters, unless the information in them is well indexed or made accessible in some other way, do not appear to move to the online format particularly well.

Table 3 summarizes the frequency of major criteria over the entire population of web sites. A table showing how many of the criteria each of the sites had will not be produced. It was not the aim of this study to compare web sites. Some of the sites actually had very few of the stated criteria, but they were excellent web sites in and of themselves.

Of the criteria studied, the most common in the population was a link to other state government information or agencies (44 sites or 88%). The sites that did not

meet this criteria generally had a web site that was a directory of a parent department (e.g. Education Department or Secretary of State Department). This usually created a situation where the library-related web site linked back to the parent department but not to any other state sites, nor to the official state page. Linking to only one state agency did not meet this criteria.

The next most common features were the address and hours of the agencies. The address criteria was met by 43 sites (86%), while the hours criteria was met by 39 (78%). An address had to be reasonably prominent to meet this criteria. It did not have to appear on the main page, but if the only mention of an address was found in a non-indexed online newsletter, the criteria was not met. If a site did not list hours, it may have been because the agency either had no public hours, or because the agency has no library to speak of, and therefore held regular office hours, and had no reason to list them.

Thirty-eight sites (76%) possessed a link to a related OPAC (online public access catalog). Many sites displayed links to several OPACs, but some displayed links to dozens of OPACs. If a site did this, and no **one** related OPAC was highlighted, the criteria was not positively fulfilled. The sites that had this problem generally had no OPAC of their own, and were listing all OPACs in their state, or the site was the statewide library network. See Table 4 for a breakdown of what type of OPAC existed. Twenty-one (55%) of the 38 sites with an OPAC linked to a web-accessible or HTTP protocol OPAC. Twenty-three (61%) of the 38 linked to an OPAC with another protocol, generally the telnet protocol. Notice the discrepancy that 21 plus 23 adds to 44, not 38. This is due to 4 of the 38 having their OPACs

available through both the web and telnet protocols, thereby giving the user a choice for accessing the OPAC. Of the 23 sites that linked to an OPAC via the telnet protocol, only 13 (57%) provided an explanation of the telnet protocol and how to configure it (see Table 5). Without this explanatory note, many web users will not be able to use the telnet link.

Thirty-seven of the 50 sites (84%) used interactive email addresses, or "mailto" links. This was the most common design feature found. This was a feature that was required to occur on the main page of the web site (the page where the link from COSLA or LC linked). The text of these interactive addresses varied (see Table 6). The text that appeared on the screen was measured, rather than the actual text of the email link. Six of the 37, or 16%, used "webmaster" or a variation such as "webmastr". Ten of the 37, or 27%, used a personal name. Twenty-one of the 37, or 57%, used another name, neither webmaster nor personal in nature, such as "webteam", "websters", or "siloweb".

Interactive forms use occurred fewer times than interactive email address use. Twenty-five (50%) sites used interactive forms. Many sites used interactive forms for a similar purpose to mailto links, for comments and questions. However, many sites used them for applications for conferences or reports. An online catalog or search engine did not count as an interactive form, as these are counted elsewhere in the study.

Two of the more specific and timely content criteria were the next most common. Thirty-six (72%) had LSCA/LSTA information. Most sites met this criteria, especially if they are the agency that handles LSCA/LSTA grants for the state.

However, there were several sites that vaguely referred to federal library grants, but did not mention them specifically as LSCA or LSTA. In these few cases, the criteria was not met because LSCA/LSTA is such a well-known term in the library community. The criteria dealing with Education Rate information was found in 33 (66%) of sites. This Education Rate criteria is very timely for this, the first quarter of 1998. If a state library agency is the unfortunate one to have to deal with this issue, then they generally possessed a very well advertised link to this particular information. Interestingly, some sites chose simply to link to or copy from other sites who did a better job of compiling appropriate information and links. A few sites displayed too much information and too many links for this particular criteria. The sites that handled it best were well-organized and had an appropriate amount of textual information.

Another content item peculiar to state library agencies was not met by very many sites. Only 14 (28%) met the Summer Reading Program criteria. Sites that met this criteria may have had just a paragraph mentioning it; or, at the other end of the spectrum, pages and pages of information with their 1998 Summer Reading Program theme. Either way, the criteria was met. Though many states have a collective effort for statewide reading programs, this effort does not receive much attention on the state library agency web sites.

Some design features aid in organizing a web site. For instance, "What's New" information points people who regularly visit a site to new items of interest. Surprisingly, just 26 (52%) employed this feature. Another feature that may aid frequent users is "Information for State Employees". Eighteen (36%) met this

criteria. Some of the sites did not meet this criteria because they had no services offered specifically to state employees. However, there were many sites that briefly mentioned services to state employees along with other services, but had no separate or stand-alone page or section for this customer base.

Much of the literature review dealt with disclosing a statement of purpose prominently, whether this be the purpose of the web site or the organization that runs the web site. Only 29 (58%) had a Mission/Vision statement. Some had both a vision and mission statement. Sometimes it was prominently displayed on the main page, and sometimes it was in an "About" section. A few sites had a "catch-phrase" on the main web page that may have stated something resembling "to serve the information needs of our customers", but this unfortunately did not count because the words "mission" or "vision" needed to part of the statement.

Not many sites - only 3 (6%) - met the Annual Report criteria. This may be due to the fact that the annual report needed to be in full text, or because the agency does not produce an annual report. An annual report might reasonably be expected to be found on a web site of a publicly held company, so why do so few state library agencies have this online? Are they not public entities with shareholders (taxpayers)? Publishing an annual report online, or at least a summary, is a great way to show what the state library agency does for the state which it serves.

Some agencies see their web sites as gateways for linking visitors to information, but others do not. This is apparent in the following statistics. Twenty-eight sites (56%) had links either to a GPO (Government Printing Office) Access gateway, or more likely, GPO itself. No other sites that were official GPO Access

gateways were found, other than Ohio. Twenty-seven (54%) linked to other public internet search engines. Any sites that did not were possibly avoiding being too link-laden, or realized that multitudes of sites link to search engines. Only 15 sites (30%) linked to regional or local media information. Some sites had all components of the media criteria, listing regional or local web sites for most media - newspapers, television, radio. Many sites listed only newspapers, or listed newspapers in conjunction with the nationwide newspaper microfilming project.

Just 12 sites (24%) linked to job information specific to the state library agency. Those that met the criteria well prominently displayed current job openings. Many sites had links to other employment web sites, or they had a "Library Job Directory" for the entire library community in the state. These did not meet the stated criteria.

Twenty-two sites (44%) contained an image of the physical building in which the agency was located. Some would argue that showing the image of where the agency is located is senseless in the age of the web, further arguing that physical boundaries and geographic distances are irrelevant. However, others would argue that seeing where an organization is physically located makes that place seem real. Either way, several agencies were either very proud of or distinctly intertwined with their building. Oregon had very detailed information about their WPA-era building. South Carolina's building presence even crept into their online presence. Their catalog is named LION, and there are coincidentally two bronze lions prominently placed at their building's front entrance.

Twenty of the 50 sites (40%) required the use of the Adobe Acrobat® reader. Of these 20, 19 (95%) provided a note, warning, or link to acquire the Adobe Acrobat® reader (see Table 7). Why do more sites provide an explanatory note for Acrobat® over telnet? Possibly because the site designers need to set up Acrobat® on their end to get information into PDF (portable document format), while setting a telnet link is much easier for a web site designer to do.

Several criteria dealt with ease of navigation. Only 8 (16%) provided an option to view the page with text only. Providing a "text-only" links makes the web site easier to navigate for two groups in particular - the sight-impaired, and web users with slow connections. However, many of the sites had few graphics that interfered with viewing the site with these impairments, but there were several agencies with graphic-laden sites that should consider offering this option. Ten sites (20%) used frames somewhere in their site. Use of frames did not always occur on the main page, however. While an option for viewing the web site without frames was not searched for in this study, the researcher noted that few of the ten had an option to view the page without frames. Fifteen sites (30%) had an internal search engine. The best of these searched only the local targeted server and directory. But several linked to a search engine that searched the whole state server. Some search engines simply did not work. The best search engines gave back results in a clear manner with the title of the page prominently displayed, rather than the URL.

For aiding infrequent users who may be trying to assess the web site, only 28 (56%) posted a "last date updated" on the main page of the web site. This particular criteria was required to be displayed on the main page of the site. However, some

sites do not put a last date updated on their main page, and only update the date on individual pages inside. A couple of sites, including Ohio, have notes at the bottom of the main page that state something like "see the individual page for last date updated." This note would positively fulfill the criteria.

Only 10 (20%) provided a visible counter on the main page of the site. This is no surprise, as it is somewhat antiquated for a web site to do this so informally. One site, West Virginia, tried to provide more meaningful statistics, but the information was woefully outdated. While the visible counter idea may have gone out of style, it was impossible to tell from an exterior view of the web site which ones use internal statistics. Determining web site statistics is an excellent way of tracking use, and therefore, effectiveness, of web pages.

Surprisingly, only 4 sites (8%) provided some type of legal disclaimer for the information they provided on their site, or the links they provided. Few sites had a disclaimer or a link to a disclaimer on the main page. One site called their disclaimer a "Travel Advisory" for anyone passing through their site.

No site met the criteria for a site cover. A site cover is possibly seen as an unnecessary waste of bandwidth for the user and a waste of time for the web site developer. The newer design features of audio sound bites and video displays were met by no web site in the population. Some of the URLs in the COSLA index led to the state server, and this state server may have had these criteria, however. See below for a discussion of problem URLs.

An average of 26% of content criteria were met, while only an average of 14% of design criteria were met. This can be accounted for because many of the

content criteria being searched for existed on the State Library of Ohio's web site, while many of the design criteria searched for did not exist on the State Library of Ohio's web site.

Problem URL discussion

There were several problems that occurred while using the COSLA index to state library web sites. One site had a singularly problematic situation. These are all discussed below, and correspond with Table 2.

According to the COSLA organization, the information provided in the paper directory is self reported (COSLA Memorandum, 1997). This may help explain why the COSLA index is problematic. Additionally, the URLs provided in the COSLA web site (as of March 1998) differ from those provided in the 1997 paper directory. For example, Tennessee's listings are for two different servers, while Ohio's is same incorrect URL. Perhaps this can be avoided if state library agencies ensure that several people in the organization review the information to be listed in the COSLA directory before it is sent to COSLA.

The most extensive problem occurred when the URL from the COSLA index did not link to the correct directory that would represent the main page of the state library agency web site. For this study, main page and home page are defined as the web page that appears when the appropriate site is selected from the COSLA or LC index. Sites with this symptom created an additional problem when the researcher attempted to measure the criteria that were required to occur on the main page of the web site. These particular measurements were taken from the

main page linked to, but the other criteria were searched for on the specific directory holding the library agency information.

There were several sites that exhibited this problem. Georgia's link from the COSLA index led to <http://www.gpls.public.lib.ga.us> instead of <http://www.gpls.public.lib.ga.us/pls>. The first URL links to the Georgia Public Library Service **Server** page. The directory **/pls** links to a much more detailed and suitable page about the Georgia Public Library Service. If the second link had been the indexed link on the COSLA index, many of the "main page" issues, such as interactive email address and visible counter, would have been positively answered.

Another example similar to Georgia is Kansas. The COSLA index links to "Blue Skyways" at <http://skyways.lib.ks.us/kansas>, the Kansas Public Library Service, while a more detailed page on the Kansas State Library begins at <http://skyways.lib.ks.us/kansas/ksl/ksl.html>. Which directory the COSLA index links to made a difference in whether some of the "main page" criteria were fulfilled.

Another example of this phenomenon is Nevada. The COSLA index leads to the Nevada Department of Museums, Libraries, and Archives web site, though there is a directory that deals with just the library division. This brings up an excellent point about deciding which site is the "main page". Where does a site administrator wish visitors to enter the site? In Nevada's case, visitors are probably best served by entering the larger departments' web site, and then find the appropriate directory for the library division.

Several URLs from the COSLA index linked to the state's official web site. This created the same problems with the "main page" criteria. These problem URLs

can be divided into two categories: 1) the library agency's web site is simply a directory of the state's server, and 2) the library agency's web site is a completely different server than the state's server.

In the first category, Massachusetts is a prime example. The COSLA index linked to <http://www.magnet.state.ma.us>, while the state library directory is located at <http://www.magnet.state.ma.us/lib/>, a directory of the state site. This directory had very little information in it. Massachusetts also suffers from the second problem category. A third web site was located at <http://www.mlin.lib.ma.us/>. This site, the Massachusetts Library and Information Network, actually holds much of the information that would be expected in state library agency web site.

New Jersey and Pennsylvania also suffered from the first problem category - the COSLA index leads to the state's server, while the library agency information is located on a directory of that server. New Hampshire's link had the same problem - but this state is notable because the New Hampshire State Library actually maintains the web site for the state government.

The next major problem actually deals with the growth of the internet. Several sites appear to have started out with a web site that resided on a parent authority's server (e.g. the state server). Then, as the state library agency's online services grew, they developed their own web site. The problem resides in deleting the outdated web site, and advising others as to the new location of the site. State agencies simply do not appear to be doing this. Though this was not in the scope of this study, it would be interesting to find out why this is not being done. It appears

that in a couple of cases, the information on the parent authority's web site is updated, but the secondary site is preferred, and is the agency's *de facto* web site.

Florida is an example of this problem. The COSLA index link was invalid, so the Library of Congress' index was employed. The link went to <http://www.dos.state.fl.us/dlis>, a directory of the Florida Department of State's web site. From this site, though, is a link to another page titled "State Library of Florida" at <http://stafla.dlis.state.fl.us>. This appears to be a site that has blossomed from an OPAC into the State Library of Florida's *de facto* web site. The state library's directory off the Florida Department of State's site is very comprehensive for library development information, and much of it appears to be updated. The question is - which site represents the State Library of Florida?

Illinois is another example. The COSLA index links to <http://www.sos.state.il.us>, the web site for the Illinois Secretary of State. A second link was found to the Illinet service at <http://www.library.sos.state.il.us>, which appears to be a separate server that sprouted up for the Illinet service but is being used as the *de facto* web site for the Illinois State Library.

Rhode Island exhibits a similar affliction. The COSLA index linked to the web site for the Office of Library & Information Services under the Rhode Island Department of Administration at <http://www.doa.state.ri.us/dsls>. Another site, <http://lori.state.ri.us/olis>, appeared to better represent the state library, though the site is under construction.

The link from the COSLA index to the site for Arkansas also went to the state server, <http://www.state.ar.us/>. The state page then linked to the web site of the

Arkansas State Library at <http://www.asl.lib.ar.us>. Interestingly, the link for Arkansas from the Library of Congress' index was to <http://www.state.ar.us/html/statelibrary.html>. This is an outdated directory of the state server, and the state of Arkansas no longer even links to it! This underscores the necessity of deleting outdated directories, and letting sites that link to them know where the new site is located. With the effort and coordination that the state of Arkansas placed early on with Internet service to its citizens, the fact that outdated information is still available is indicative of an unmanaged and uncoordinated web site (Hawkes, 1996).

Another problem also deals with the overall issue of internet growth. Some URLs in the COSLA index link to a statewide public library service, or a similar service, even though a site that better fits into COSLA definition exists. Colorado is a prime example of this. The COSLA index links to the ACLIN (Access Colorado Library & Information Network) site at <http://www.aclin.org>, while a different site exists on the Colorado Department of Education's server at <http://www.cde.state.co.us/slindex.htm>. This site represents the Colorado State Library and Adult Education Office. It appears that the ACLIN organization is a division of the Colorado State Library and Adult Education Office. Both sites also link to each other.

Tennessee was singularly problematic. The COSLA index linked to the catalogs of Tennessee Libraries on the Auto-Graphics, Inc. web site at <http://www.auto-graphics.com/webpac/tennessee>. The Library of Congress' index links to a more reasonable expectation of the Tennessee State Library web site at

<http://www.state.tn.us/sos/statelib/tslahome.htm>. The paper version of the 1997 COSLA Directory lists the Tennessee web site with the same URL as the Library of Congress' index on the web (COSLA Directory, 1997).

Summary and Conclusions

The results of this study are more understandable when considering the unexpected and apparent problem that some organizations have in deciding where their web site is located. Quite possibly the decision is not even theirs to make. Approximately 30% of web sites in this study either exhibited one of the above problems or had a technical error when trying to access them from the COSLA index of state library agency web sites. Fortunately, other indices to this genre of web sites exist. In addition to the Library of Congress, which was used as a backup to the COSLA index, many state library agencies index the state library agency web sites.

The following are recommendations that state library agencies may want to consider when redesigning their web sites. Clean up or remove old directories on the web server. No information on a subject is better than old, outdated information. Doing this will enhance the authority of the site. After doing this, find out who may still be linking to directories that have been moved or eliminated in a redesign. Make the new or alternative URLs known to those who still link to invalid addresses. This list may include other state library agencies, COSLA, the Library of Congress, public search engines, and other communities of web sites that the state library agency may be a part of. The problem of listing outdated URLs still exists in paper indices and directories, as seen in the paper version of the COSLA Directory. Therefore,

have several pertinent staff persons review the COSLA Directory draft sheets and other directory listings when they arrive each year.

Several recommendations can be made to assist in visitors' navigation of a state library agency web site. Try to pare down the main page to one or two screen lengths. Several of the state library agency main pages were up to five screen lengths! Provide a text-only link for those visitors who are either site-impaired or prefer to view the site without graphics. Index online newsletters and other related items, so that when a visitor wants to find that article they skimmed in a newsletter last year, they do not have to wade through issue after issue of PDF-formatted newsletters. Alternately, provide a search engine for the site that will produce results that include the title of the web page, rather than a meaningless URL.

Finally, it would seem that most state library agencies obviously take their web sites very seriously and keep them updated. Other agencies either do not have the people power to keep their site updated, or their web presence is not a high organizational goal. In the case of the latter, it may be advisable to eliminate web services until a time comes that these services become higher organizational goals.

The results of this study place the web site of the State Library of Ohio in some perspective. Because many of the content features already found on the State Library of Ohio site were searched for at other sites, and some of the design features currently not used on the State Library of Ohio site were searched for, the results were as expected. Much of the basic content information such as hours and address produced expected results. More sites were found to require use of the

Adobe Acrobat reader than were expected. Site cover use, and video and audio use produced expected zero results.

Future research possibilities could include doing a content analysis of the web sites of other genres to which the State Library of Ohio belongs, such as web sites of other state of Ohio agencies. The criteria used in this study are meant to be flexible, and are intended to make the future development of web sites an easier process.

The process of how data is reported to the COSLA organization, and how this information is translated onto the COSLA web site would make an interesting study. Other questions would include: how does COSLA manage their web page and the directories within; are URLs checked for accuracy, or at least to see if they connect to a working site; and who at state library agencies checks the drafts of entries for the COSLA Directory. Repeating this study in one year to see if and how the listings for URLs of state library agencies on the COSLA index change could be warranted.

A questionnaire could be sent to state library agencies asking for a history of their web services experiences. Specifically, it would be interesting to find out why multiple sites exist for one organization. Is this a political issue, or one that deals with lazy or ignorant web site administrators?

Finally, this study could be redone in six months to one year to see if the results change. Will audio and video plug-in use rise? Will frames use rise or fall? Will use of web-accessible OPACs rise?

Looking at the community of web sites for similarities and differences provided insight into what should be included in a state library agency web site, and

helped to determine if customers are being served. Many of the articles cited in the literature review focused on the end-user, or web site visitor, and this customer base is ultimately where the solutions to the issues in this study dwell. A summary of this study will be given to those responsible for web site design at the State Library of Ohio. It is hoped that by identifying the content and design features of web sites of this particular genre, an improved web site redesign process will occur.

Table 1. Criteria Selection and Explanation

	CONTENT/LINKS		No distinction will be made between actual content on the targeted server and links to other servers; however, if a link is used, it must be the first link from the targeted server/directory. Items that are buried in non-indexed online newsletters will not meet criteria. The item must be reasonably prominent.
1	Link to OPAC	Stover and Zink	Many library sites provide access to their OPAC (online public access catalog), or associated OPACs. If access to numerous OPACs is offered, and there is no "main" OPAC, the criteria will not be met.
1.1	OPAC http protocol?	Researcher	Many libraries are starting to provide http (web) access to their OPACS
1.2	OPAC other protocol?	Researcher	Telnet (terminal emulation) is the major other protocol used
1.22	Explanatory note for telnet?	Researcher	If a protocol other than http is used, is there an explanatory note for configuring this protocol?
2	Media information	Clyde	Links to local or regional newspapers, television stations, radio stations, not just a link to a page that does not focus on the local or regional aspect of this criteria.
3	State government information	Clyde Stover and Zink	Links to the state government to which the state library agency belongs
4	GPO Access gateway link	Researcher	The State Library of Ohio web site is a GPO Access gateway. These gateways provide access to Federal government information. Is there a link to a GPO Access gateway?
5	Public Internet search engines	Clyde	Public Internet search engines such as Yahoo, InfoSeek, etc...
6	Mission/Vision statement	Stover and Zink	Must be titled "mission" or "vision"
7	Annual Report	Researcher/SLO staff	Must be titled "Annual Report"; must appear to be in full-text
8	Address of agency	Researcher	The mailing address of the agency
9	Hours of agency	Researcher	The hours the agency is open
10	Job information for agency	Researcher	This must include job listings for the specific agency
11	What's New information	SLO staff	Must be a section or page titled "What's New" or be a graphic that indicates a "New" item. Must appear on the main page of the targeted server/directory.
12	Information for state employees	Researcher	Must be a section or page that is specifically aimed to employees of the state in question
13	LSCA/LSTA information	Researcher	Information must be titled "LSCA", "LSTA", or "federal" grants
14	Summer Reading Program info	SLO staff	Information must be titled "Summer Reading Program"
15	Education Rate information	Researcher	Timely for the first quarter of 1998, as the window for applying for Education Rate discounts (a.k.a. E-Rate, Universal Discounts, Telecommunications Act) will be open only through April.

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	DESIGN FEATURES		These features must be on the original targeted server/directory. A link off the server that leads to one of these features will not result in a positively fulfilled criteria.
16	Interactive forms	Clyde Stover and Zink	Forms that allow for feedback to the web site designers (e.g. surveys, comments). Catalogs and search engines will not result in positive fulfillment, as they are covered elsewhere in this survey.
17	Mailto: Links	Clyde Stover and Zink	A coded html link that will bring up a form automatically, and be ready to send to the stated email address. Must appear on the main page of the targeted server/directory.
17.1	Webmaster mailto: link	Researcher	Many web site managers use this for Mailto: links. Most web sites have this address at the bottom of each page. This "bottom-page" address will be used to fulfill this criteria. Must appear on the main page of the targeted server/directory. The text appearing on the web page will be looked at to fulfill this and the next two criteria, rather than the actual mailto: link text.
17.2	Personal name mailto: link	Researcher	Some web site managers use a personal name for the mailto: link.
17.3	Other mailto: link	Researcher	For other names used in mailto links (e.g. webteam, ndsl)
18	Visible counters	SLO staff	No distinction will be made between counters that measure how many web pages are accessed by visitors, and how many visitors there are to the site as a whole
19	Internal search engine	Researcher	A search engine that searches only the web site in question. Many web site managers will use a version of a public Internet Search engine that provides the option to search only that site, or the whole Internet. Must appear on the main page of the targeted server/directory.
20	Option for text-only page	SLO staff	For ADA provisions. Also for those users who do not want graphics, either because they do not have enough bandwidth for dealing with graphics, or are using a web browser such as Lynx. Must appear on the main page of the targeted server/directory.
21	Frames use	SLO staff	Sites that separate the web page into sections for easy navigation
22	Audio use	Researcher	Use of plug-ins such as RealAudio®
23	Video use	Researcher	Use of plug-ins such as Macromedia Shockwave®
24	Site cover/introduction page	Yale C/AIM web site	A page that has little actual information. May also be titled a "welcome" page.
25	Image of agency building	Clyde	Must be a graphical representation of the building that houses the agency.
26	Adobe Acrobat® required?	Stover and Zink	Adobe Acrobat® is a plug-in that allows the user to view documents that have been placed in PDF, or portable document format.
26.1	Explanatory note for Acrobat?	Researcher	Is there a note explaining how to find and install the plug-in to view PDF files?
27	Legal information/disclaimer	Researcher/SLO staff	Many web sites have a link that spells out a disclaimer to accuracy of information presented. Many title this "legal stuff". Must appear on the main page of the targeted server/directory.
28	Last date updated	Clyde Stover and Zink	An indication of when the site was last updated. Must appear on the main page of the targeted server/directory.

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Table 2. Selection of appropriate URL (Uniform Resource Locator)

State	COSLA Index used?	Error/problem with COSLA URL Index	LC Index used?	Final URL used (local targeted server)
Alabama	x			http://www.apls.state.al.us/
Alaska		404 Not Found The requested URL /local/library/state.html not found	x	http://www.educ.state.ak.us/lam/library.html
Arizona	x			http://dlapr.lib.az.us/
Arkansas	x			http://www.state.ar.us/
California	x			http://www.library.ca.gov/
Colorado	x			http://www.aclin.org
Connecticut	x			http://www.cslnet.ctstateu.edu
Delaware	x			http://www.lib.de.us
Florida		404 Not Found The requested URL /www.doc.state.fl.us/flglis was not found on this server	x	http://www.dos.state.fl.us/dlis
Georgia	x			http://www.gpls.public.lib.ga.us/
Hawaii		Error 404 Not Found - files doesn't exist or is read protected	x	http://www.hcc.hawaii.edu/hspls/hsplshp.html
Idaho	x			http://www.lili.org/isl/hp.htm
Illinois	x			http://www.sos.state.il.us
Indiana	x			http://www.statelib.lib.in.us
Iowa	x			http://www.silo.lib.ia.us
Kansas	x			http://skyways.lib.ks.us/kansas
Kentucky	x			http://www.kdla.state.ky.us
Louisiana		Unable to locate server smt.lib.la.us	x	http://smt.state.lib.la.us/statelib.htm
Maine	x			http://www.state.me.us/msl/mslhome.htm
Maryland		HTTP/1.0 404 Object Not Found	x	http://www.sailor.lib.md.us
Massachusetts	x			http://www.magnet.state.ma.us/lib/

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Michigan	x			http://www.libofmich.lib.mi.us
Minnesota	x			http://www.educ.state.mn.us
Mississippi		Unable to locate server: www.mlc.state.ms.us	x	http://www.mlc.lib.ms.us
Missouri		Error 404 Not Found - File doesn't exist or is read protected	x	http://mosl.sos.state.mo.us/lib-ser/libser.html
Montana	x			http://msl.mt.gov
Nebraska	x			http://www.nlc.state.ne.us
Nevada	x			http://www.clan.lib.nv.us
New Hampshire	x			http://www.state.nh.us
New Jersey	x			http://www.state.nj.us
New Mexico	x			http://www.stlib.state.nm.us
New York	x			http://www.nysl.nysed.gov
North Carolina	x			http://statelibrary.dcr.state.nc.us
North Dakota	x			http://www.sendit.nodak.edu/ndsl
Ohio		File not found/The requested URL /ohio.gov was not found on this server	x	http://winslo.ohio.gov
Oklahoma	x			http://www.state.ok.us/~odl
Oregon	x			http://www.osl.state.or.us/oslhome.html
Pennsylvania	x			http://www.cas.psu.edu/pde.html
Rhode Island	x			http://www.doa.state.ri.us/dsls
South Carolina	x			http://www.state.sc.us/scsl
South Dakota	x			http://www.state.sd.us/state/executive/deca/ST_LIB/slib.html
Tennessee	x			http://www.autographics.com/webpac/tennessee
Texas	x			http://www.tsl.state.tx.us
Utah	x			http://www.state.lib.ut.us
Vermont	x			http://dol.state.vt.us
Virginia	x			http://leo.vsla.edu/lva/lva.html
Washington	x			http://www.wa.gov/wsl
West Virginia	x			http://www.wvlc.wvnet.edu
Wisconsin	x			http://www.dpi.state.wi.us/dlcl
Wyoming		Server down or not responding	x	http://www-wsl-state.wy.us

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Table 3 - Frequency Table

Criteria	*Frequency*
State government information	44
Address of agency	43
Hours of agency	39
Link to OPAC	38
Interactive email address	37
LSCA/LSTA information	36
Education Rate information	33
Mission/Vision statement	29
GPO Access gateway link	28
Last date updated	28
Public Internet search engines	27
What's New information	26
Interactive forms	25
Image of agency building	22
Adobe Acrobat required?	20
Information for state employees	18
Internal search engine	15
Media information	15
Summer Reading Program info	14
Job information for agency	12
Frames use	10
Visible counters	10
Option for text-only page	8
Legal information/disclaimer	4
Annual Report	3
Site cover/Introduction page	0
Video use	0
Audio use	0

Table 4 - OPACs

Criteria	*Frequency*
Link to OPAC	38
OPAC http protocol?	21
OPAC other protocol?	23

Table 5 - Telnet Note

Criteria	*Frequency*
OPAC other protocol?	23
Explanatory note for telnet?	13

Table 6 - Interactive Email Address

Criteria	*Frequency*
Interactive email address	37
Other email address	21
Personal name email address	10
Webmaster email address	6

Table 7 - Acrobat Plugin Note

Criteria	*Frequency*
Adobe Acrobat required?	20
Explanatory note for Acrobat?	19

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Appendix A

Data Collection Instrument **State of _____**

	Criteria	Yes	No	Comments
	CONTENT/LINKS			
1	Link to OPAC			
1.1	OPAC http protocol?			
1.2	OPAC other protocol?			Specify:
1.22	If other, is there a note?			
2	Media information			
3	State government information			
4	GPO Access gateway link			
5	Public Internet search engines			
6	Mission/Vision statement			
7	Annual Report			
8	Address of agency			
9	Hours of agency			
10	Job information for agency			
11	What's New information			
12	Information for state employees			
13	LSCA/LSTA information			
14	Summer Reading Program info			
15	Education Rate information			

	Criteria	Yes	No	Comments
	DESIGN FEATURES			
16	Interactive forms			
17	Interactive email address			
17.1	Webmaster email address			
17.2	Personal email address			Specify:
17.3	Other email address			Specify:
18	Visible counters			
19	Internal search engine			
20	Option for text-only page			
21	Frames use			
22	Audio use			
23	Video use			
24	Site cover/Introduction page			
25	Image of agency building			
26	Adobe Acrobat required?			
26.1	Explanatory note for plug-in?			
27	Legal information/disclaimer			
28	Last date updated			

General comments on web site, links organization, and anomalies: